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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,045	01/14/2002	Uri Gold	U 013827-7	8675
140	7590	04/26/2006	EXAMINER	
LADAS & PARRY 26 WEST 61ST STREET NEW YORK, NY 10023			CHAWAN, SHEELA C	
			ART UNIT	PAPER NUMBER
			2624	

DATE MAILED: 04/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,045

Applicant(s)

GOLD ET AL.

Examiner

Sheela C. Chawan

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/9/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 325, 327, 354-357, 360-362, 364, 365, 373-377, 379-382, 409-412, 437 and 439-444 is/are allowed.
- 6) ☒ Claim(s) 316, 318-320, 322, 396-399 and 401-408 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 316,318-320,322,325,327,354-357,360-362,364,365,373-377,380-382,396-399,401-412,437 and 439-444.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on 1/19/06 has been entered and made of record.

With this amendment, claims 1-315, 317, 321, 323-324, 326, 328-353, 358-359, 366-372, 363, 378, 383-395, 400, 413-436 and 438 are cancelled.

Claims 440-444 are added new.

Claims 316, 318-320, 322, 325, 327, 354-357, 360-362, 364-365, 373-377, 380-382, 396-399, 401-412, 437 and 439-444 are pending in the application.

The indicated allowability of claims 316, 318-320, 322, 396-399, 401-408, 440 is withdrawn in view of the newly discovered references to Gleason et al. (US 6,456, 899 B1) and Yaniv et al. (US 6,586,829 B1). Rejections based on the newly cited references are as follow.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 316, 318-320, 322, 396, 401, 404 and 440 are rejected under 35 U.S.C. 102(e) as being anticipated by Gleason et al. (US 6,456,899 B1).

As to claim 316, Gleason discloses an automated optical inspection device suitable for inspection of an article (at least Figure 1; a semiconductor wafer is an article) comprising:

at least one detector providing a polychromatic image (color defect image 22 in Figure 1 corresponds to a polychromatic image) output of at least a portion of an article (color reference image 21 and color defect image 22 indicating a portion of a wafer in Figure 1 are generated from a several in-line defect inspection systems which inherently includes at least one detector; for example, optical microscopes, SEM, or laser scattering systems as are commonly employed by semiconductor manufacturers; see column 2, lines 48-63; column 5, line 66 to column 6 line 10); and

processing circuitry receiving said polychromatic image output and providing edge detection to sub-pixel accuracy (column 7, lines 14-33; Figure 4) operative to distinguish borders among regions of different color said processing circuitry being operative to distinguish a border between a first color region associated with a first color population and a second color region associated with a second color population by identifying an approximate border location between said first color region and said second color region and determining a location of a border between said first color region and said second color region by using a preferred method for identifying the location of a border between said first color population and said second color population (column 3, lines 28-51; column 5 line 66 to column 6 line 10; three channels red, green and blue provide different color regions and excess red and excess blue and excess

green provides different color population; column 7, lines 14-33 provides a sub-pixel accuracy)

As to claim 318, Gleason discloses an automated optical inspection device according to claim 316, and-wherein said polychromatic image output comprises a color image represented using a color image representation method having a plurality of color defining characteristics (column 3, lines 43-51; column 5 line 66 to column 6 line 10), and

each said preferred method is selected from a plurality of available methods, and the plurality of available methods includes, for each color defining characteristic within the plurality of color defining characteristics, a method comprising performing an edge locating method in a component of the color image associated with said color defining characteristic (Figure 1-3).

As to claim 319, Gleason discloses an automated optical inspection device according to claim 318 and wherein the edge locating method comprises a sub-pixel contour-element locating method (at least block 51 in Figure 4 is used for sub pixel accuracy).

As to claim 320, Gleason discloses an automated optical inspection device suitable for inspection of an article (Figures 1- 4; a semiconductor wafer provides an article) comprising:

at least one detector providing an image output of at least a portion of an article (a defect image corresponds to a portion of a wafer) having at least three different regions (column 3 line 64 to column 4 line 3 provides four different regions), each of

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which regions is distinguished at least by an optical characteristic detectable by said detector (color reference image 21 and color defect image 22 are generated from a several in-line defect inspection systems which inherently includes at least one detector; for example, optical microscopes, SEM, or laser scattering systems as are commonly employed by semiconductor manufacturers; see column 2, lines 48-63; column 5, line 66 to column 6 line 10; and

processing circuitry receiving said image output and providing edge detection to sub-pixel accuracy operative to distinguish borders of said at least three different regions (block 51 in Figure 4 is used for sub-pixel accuracy; see column 7, lines 14-18).

As to claim 322, Gleason discloses an automated optical inspection device according to claim 320 and wherein said processing circuitry provides mapping based at least partially on said image output which identifies materials in each of said different regions having a common border (at least blocks 43 and 45 in Figure 2 provides determination of layers and materials).

As to claim 396, Gleason discloses an automated optical inspection device suitable for inspection of an electrical circuit (Figures 1-4), comprising:

at least one detector (column 2, lines 48-63) providing an image output of at least a portion of an electrical circuit comprising multiple materials (blocks 43, 45 provide multiple layers and materials); and

processing circuitry receiving said image output and providing an output

indication of the presence of at least two materials out of a group of at least three predetermined materials (column 5 line 66 to column 6 line 10; column 6, lines 39-46; column 9, lines 37-42).

As to claim 401, Gleason discloses an automated optical inspection device according to claim 396 and wherein said processing circuitry provides an output indication of the presence of at least three predetermined materials (column 3, lines 28-35; a plurality of different material indirectly provides at least three predetermined materials).

As to claim 404, Gleason discloses an automated optical inspection device according to claim 396 and wherein said processing circuitry provides an output indication of the presence of a solder mask (Figure 5) material.

As to claim 440, see the rejection of claims 320 and 322.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 397,398,399,402,403, 405-408 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gleason et al. (US 6,456,899 B1), as applied to the claims

316, 318-320, 322, 396, 401, 404 and 440 above and further in view of Yaniv et al., (US. 6,586,829 B1).

For claims 397, 398, 399, 402, 403, 405-408, Gleason does not clearly disclose that the processing circuitry comprises a printed circuit board, a ball grid array substrate, a flat panel display substrate, copper, gold, silver, photo resist residue, an oxidized metal, and a circuit viewed through a translucent overlay as claimed. However, Yaniv discloses a ball grid array package comprising a printed circuit board (column 3, lines 15-17; column 1, lines 35-38), a ball grid array substrate (title, abstract), a flat panel display substrate (column 2, lines 41-43), copper (column 2, lines 49-53), gold (column 2, lines 49-53), silver (column 5, lines 5-8), photo resist residue (Figure 4), an oxidized metal (Figure 4), a circuit viewed through a translucent overlay (column 5 line 66 to column 6 line 9). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention to modify the device of Gleason by including the teaching of Yaniv because such a modification will provide a low cost BGA fabrication as mentioned by Yaniv at column 1, lines 39-41.

Allowable Subject Matter

4. The following is a statement of reasons for the indication of allowable subject matter.

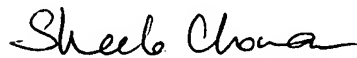
Applicant has amended the independent claims 325, 354, 373, 409, 437 and 441-444 by adding the allowable subject matter as indicated in the previous office action. Therefore, claims 325, 327, 354-357, 360-362, 364-365, 373-377, 379-382, 409-412, 437, 439, 441- 444 are allowed.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is. 571-272-7446. The examiner can normally be reached on Monday - Thursday 7.30 - 6.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sheela Chawan
Patent Examiner
Group Art Unit 2624
April 13, 2006